DEPARTMENT OF THE ARMY
WALTER REED ARMY MEDICAL CENTER
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WRAMC Regulation
No. 40-70

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Medical Services

LABORATORY POLICIES AND PROCEDURES FOR NOTIFICATION OF CRITICAL VALUES

*This regulation supersedes WRAMC Reg 40-70, dated 2 August 1999.

WRAMC Reg 40-70

1. Purpose. This regulation prescribes policies, responsibilities and administrative procedures for notification of critical laboratory values.

2. Applicability. The provisions of this regulation apply to all personnel assigned to the Department of Pathology and Area Laboratory Services and all personnel at Walter Reed Army Medical Center (WRAMC) who are involved in direct patient care.

3. References.

a. Cobas Integra Method Manual, Roche Diagnostic Systems, Inc., Somerville, NJ

b. Test Methodologies, Ortho-Clinical Diagnostics, Rochester, NY

c. Tables of Critical Laboratory Values, WRAMC Department of Pathology and Area Laboratory Services Directory of Laboratory Services

d. Clinical Diagnosis and Management, Henry J.B., (W.B. Saunders Co.)

e. Managing the Patient Focused Laboratory, Lundberg, G.D, (Medical Economics: 1975)

f. Comprehensive Accreditation Manual for Pathology and Clinical Laboratory Services, Joint Commission on Accreditation of Healthcare Organizations

4. Background.

a. The concept of reporting critical laboratory values has been the standard of practice for all accredited laboratories since the early 1970's. The Joint Commission on Accreditation of Healthcare Organizations and the College of American Pathologists both require accredited laboratories to have a system in place for reporting critical values. Critical laboratory values, also referred to as critical limits or panic values, are test results that potentially require prompt medical attention. Critical results are those that are so far from the norm as to indicate a potentially dangerous patient condition; urgent clinician notification is a responsibility of the laboratory.

b. The laboratory test files in the Composite Health Care System (CHCS) are designed to automatically generate a notice to the test requester whenever a critical laboratory value has been certified/ reported. Additionally, reports of critical values can simultaneously be sent to designated printers.

5. Responsibilities.

a. The Chief, Department of Pathology and Area Laboratory Services (DPALS) will establish laboratory procedures for identification, verification and reporting of critical laboratory values.

b. Staff pathologists, pathology residents, laboratory supervisors and testing personnel will become thoroughly familiar with the critical values list and the procedures developed for prompt notification of critical values.

c. Direct care providers (physicians, dentists and mid-level practitioners) will become thoroughly familiar with the procedures developed for notification of critical values.

d. Laboratory supervisors will develop internal policies and procedures for validation of critical value findings.

e. The Laboratory's computer specialists will ensure CHCS files are properly edited to reflect currently accepted critical laboratory values.

6. Policies.

a. Even though CHCS automatically generates notices of critical values, laboratory personnel will also personally notify the test requester, whenever possible.

b. Laboratory personnel will, during the CHCS critical result certification process, add a comment noting the name of the person making the notification, the name of the person notified and date and time of notification. During periods of computer downtime, a similar notation will be made on the laboratory requisition form.

c. The complete list of critical laboratory values for this hospital is at Appendix A.

7. Procedures.

a. During regular duty hours (Monday-Friday, 0730-1630), Laboratory testing personnel who detect a critical value will notify the test requester by either telephone or page. If the requester cannot be reached, the medical technologist/laboratory technician will call the patient's ward or clinic and report the critical value to the appropriate clinical person responsible for patient care. For inpatients, this will be the Registered Nurse (RN) team leader. For outpatients, this will be the Clinic Head Nurse.

b. After regular duty hours:

(1) The procedure for notification of inpatient critical values remains the same. If the test requester cannot be contacted, the report will be telephoned to the ward and given to the RN team leader.

(2) Outpatient critical value notification requires a modified procedure. Laboratory testing personnel who detect a critical value will attempt to contact the test requester. This includes using CHCS or the hospital information desk to obtain home phone numbers or pager numbers. If the requester cannot be reached, the pathologist-on-call will be notified and asked to notify the appropriate hospital officer of the day, i.e., Medical Officer of the Day, Surgical Officer of the Day, Pediatric Officer of the Day, etc., based upon the department of the ordering physician. The appropriate hospital officer of the day then has responsibility for contacting the patient, or taking other appropriate action.

APPENDIX A
LABORATORY CRITICAL VALUES

I. Adults

TEST	UNITS	CRITICAL LOW	CRITICAL HIGH
CLINICAL CHEMISTRY			
Glucose	mg/dl	50	400
Sodium	mmol/L	120	160
Potassium	mmol/L	2.8	6.5
Chloride	mmol/L	70	130
CO2 content	mmol/L	11	40
Urea Nitrogen	mg/dl	---	120
Creatinine	mg/dl	---	10
Calcium	mg/dl	7	12
Magnesium	mg/dl	1.0	5.0
Phosphorus	mg/dl	1.0	6.0
Uric Acid	mg/dl	---	13
Osmolality	mOsm/L	250	325
CSF Glucose	mg/dl	35	---
Lactate	mmol/L	---	3.4
Bilirubin, total	mg/dl	---	15
HEMATOLOGY			
Hematocrit	%	20	60
Hemoglobin	g/dl	6.6	20
White blood cell count	TH/CUMM	2.0	40
Platelet count	TH/CUMM	20	1000
Prothrombin Time	seconds	---	30
APTT	seconds	---	120
Fibrinogen	mg/dl	80	1000

Qualitative critical results for adults:
Incompatible crossmatch; presence of malignant cells/blasts in cerebrospinal fluid (CSF) or body fluids; elevated WBC count in CSF; presence of blasts on blood smear; CSF- Venereal Disease Research Laboratory (VDRL) test results of any reactivity/ titer; CSF Lyme test positive; STAT gram stain positive; zygomycete seen on any direct smear; positive blood culture gram stain; presence of blood/tissue parasites; presumptive *Pseudomonas aeruginosa* isolated from eye; positive surgical/Operating Room smear; initial Cryptococcal Antigen (serum/ CSF) positive; dimorphic fungi present from any source; positive Gram stain of blood/CSF; initial acid fast bacillus (AFB) smear positive.

APPENDIX A (continued)
LABORATORY CRITICAL VALUES

II. Children

TEST	UNITS	CRITICAL LOW	CRITICAL HIGH
CLINICAL CHEMISTRY			
Glucose	mg/dl	50	500
Sodium	mmol/L	125	160
Potassium	mmol/L	2.5	6.5
Chloride	mmol/L	70	130
CO2 content	mg/dl	11	40
Urea Nitrogen	mg/dl	---	60
Creatinine	mg/dl	---	5.0
Calcium	mg/dl	7	12
Magnesium	mg/dl	1.0	5.0
Phosphorus	mg/dl	1.0	8.9
Uric Acid	mg/dl	---	13
Osmolality	mOsm/L	250	325
CSF Glucose	mg/dl	35	---
Lactate	mmol/L	---	3.4
Bilirubin, total	mg/dl	---	15
Albumin	g/dl	2.0	7.0
Ammonia	umol/L	---	110
Protein	g/dl	3.5	10
CSF Protein	mg/dl	---	180
HEMATOLOGY			
Hematocrit	%	20	50
Hemoglobin	g/dl	6.6	16
White blood cell count	TH/CUMM	2.0	40
Platelet count	TH/CUMM	50	1000
Prothrombin Time	seconds	---	25
APTT	seconds	---	120
Fibrinogen	mg/dl	80	1000

Qualitative critical results for children:
Incompatible crossmatch; presence of malignant cells/ blasts in CSF or body fluids; elevated WBC count in CSF; presence of blasts on blood smear; new diagnosis or findings of leukemia; CSF- Venereal Disease Research Laboratory (VDRL) test results of any reactivity/ titer; CSF Lyme test positive; STAT gram stain positive; zygomycete seen on any direct smear; positive blood culture gram stain; presence of blood/tissue parasites; presumptive *Pseudomonas aeruginosa* isolated from eye; positive surgical/Operating Room smear; initial Cryptococcal antigen (serum/CSF) positive; dimorphic fungi present from any source; positive Gram stain of blood / CSF; initial acid fast bacillus (AFB) smear positive.

APPENDIX A (continued)
LABORATORY CRITICAL VALUES

CRITICAL VALUES FOR DRUG LEVELS

DRUG	THERAPEUTIC RANGE	CRITICAL VALUE
Acetaminophen	10-30 ug/ml	>50 ug/ml
Carbamazepine	4-12 ug/ml	>20 ug/ml
Digoxin	0.8-2.0 ng/ml	>2.5 ng/ml
Gentamicin	6-10 ug/ml	>12 ug/ml peak
Lidocaine	1.5-6.0 ug/ml	>9 ug/ml
Lithium	0.6-1.2 mEq/L	>2.5 mEq/L
Phenobarbital	10-30 ug/ml	>60 ug.ml
Phenytoin	10-20 ug/ml	>40 ug/ml
Primadone	5-12 ug/ml	>24 ug/ml
Procainamide	4-10 ug/ml	>40 ug/ml
Quinidine	1.5-5.0 ug/ml	>10 ug/ml
Salicylate	3-30 mg/dl	>30 mg/dl
Theophylline	10-20 ug/ml	>25 ug/ml
Valproic Acid	50-100 ug/ml	>200 ug/ml

The proponent agency for this publication is the Department of Pathology and Area Laboratory Services. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, Walter Reed Army Medical Center, ATTN: MCHL-U, 6900 Georgia Avenue NW, Washington, DC 20307-5001.

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